



FOR THE SCOPE OF  
ACCREDITATION UNDER NVLAP LAB  
CODE 100402-0.

## REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Project No. G100557536

Date: July 31, 2012

REPORT NO. 101235726CRT-007

TEST OF ONE POLYOPTIK™ 20° 3500K LED MODULE

LED MODULE MODEL NO. H1977.010  
DRIVER MODEL NO. LMPS-350 1006.69

RENDERED TO

HEICO LIGHTING™  
400 du PARC  
ST-EUSTACHE, QUEBEC  
CANADA, J7R 0A1

TEST: Electrical and Photometric tests as required to the IESNA test standard.

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number 500436155.

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79: 2008 Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2008 Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted 27 production samples of model number H1977.010. The samples were received by Intertek on June 24, 2013, in undamaged condition, and one sample was tested as received. The sample designation was CRT1306241043-002AA.

DATES OF TESTS: July 26, 2013 through July 30, 2013.

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SUMMARY

Model No.:	H1977.010
Description:	POLYOPTIK™ 20° 3500K
Test Note:	Testing performed on one LED module with 26 additional modules connected to the power supply for proper loading per client request.

Criteria	Result
Module Lumen Output	112.5 Lumens
Output Power per Module (W)*	1.41
Module Efficacy (Lm/W)	79.79
Full Kit Input Power Factor	0.979
Full Kit Input Current ATHD	9.35 %
Correlated Color Temperature (CCT)	3508 K
Color Rendering Index (CRI) – Ra	82.7
Color Rendering Index (CRI) - R9	14.3
Duv	0.001
Chromaticity Coordinate (x)	0.404
Chromaticity Coordinate (y)	0.389
Chromaticity Coordinate (u')	0.236
Chromaticity Coordinate (v')	0.511

\*TEST NOTE: Output Power per Module was calculated by dividing total Output Power by number of modules in full kit.

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Calibration Date	Calibration Due Date
Leeds & Northup Standard Resistor	Manganin	Y089	02/07/13	02/07/14
Data Precision Digital Voltmeter	3600	V124	02/07/13	02/07/14
Fluke Multimeter	45	M133	02/07/13	02/07/14
Kikusui DC Power Supply	35-10L	E160	N/A	N/A
Sorenson DC Power Supply	DLM150-20E	N/A	N/A	N/A
NIST Spectral Flux Standard Source	RF1024	N/A	9/18/2010	100 hrs of use
ITS 2 Meter Integ. Sphere	---	N308	VBU	VBU
Labsphere Diode Array	CDS 600	W/N308	07/01/13	08/01/13
Xitron Power Analyzer	2503AH	E235	05/10/13	06/10/14
Fluke Temp Meter	52	T801	09/07/12	09/07/13
Extech Hygro-Thermometer	445703	T1366	11/8/12	11/08/13
Elgar AC power supply	CW1251	---	---	---
LSI High Speed Mirror Goniometer	6440	---	07/24/13	08/24/13
Elgar Power Supply	CW1251	---	VBU	VBU
Yokogawa Power Analyzer	WT210	E464	04/17/13	04/17/14
Extech Hygro Thermometer	445703	T1359	11/08/12	11/08/13
Fisher Scientific	---	N1132	04/22/13	04/22/14
M-D Building Products	Smart Tool	L112	02/13/13	02/13/14
Yokogawa Power Analyzer	WT1600	E462	07/17/13	07/17/14

## TEST METHODS

### Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

### Photometric and Electrical measurements – Distribution Method

A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

### Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere Model CDS 1100 CCD Array Spectroradiometer and Two Meter or Ten Foot Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation. Each SSL unit was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

The calibration of the sphere photometer-spectroradiometer system is traceable to the National Institute of Standards and Technology.

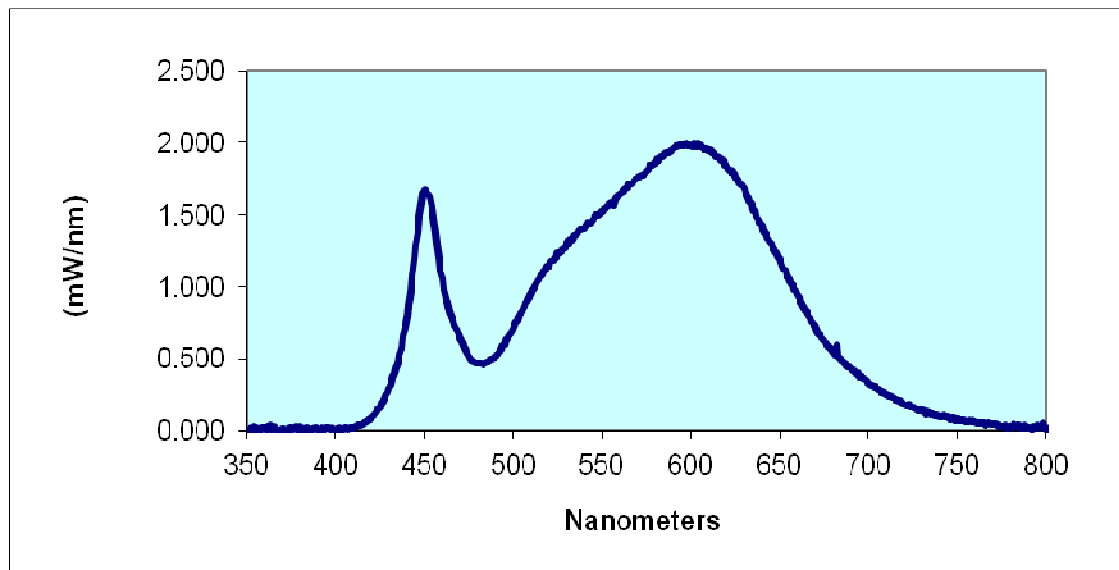


**RESULTS OF TESTS**

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
H1977.010							
350	-0.025	460	1.057	570	1.753	680	0.543
355	0.016	465	0.806	575	1.803	685	0.488
360	0.022	470	0.639	580	1.860	690	0.429
365	0.029	475	0.512	585	1.914	695	0.373
370	0.011	480	0.465	590	1.953	700	0.333
375	0.015	485	0.476	595	1.985	705	0.288
380	0.022	490	0.524	600	1.977	710	0.255
385	0.004	495	0.600	605	1.971	715	0.221
390	0.004	500	0.716	610	1.945	720	0.185
395	0.017	505	0.835	615	1.906	725	0.167
400	0.003	510	0.961	620	1.836	730	0.136
405	0.014	515	1.064	625	1.766	735	0.116
410	0.022	520	1.138	630	1.680	740	0.097
415	0.043	525	1.239	635	1.535	745	0.097
420	0.090	530	1.303	640	1.428	750	0.079
425	0.167	535	1.355	645	1.296	755	0.061
430	0.296	540	1.405	650	1.192	760	0.058
435	0.471	545	1.472	655	1.059	765	0.000
440	0.786	550	1.523	660	0.947	770	0.048
445	1.289	555	1.583	665	0.832	775	0.028
450	1.669	560	1.645	670	0.731	780	0.025
455	1.480	565	1.709	675	0.624		

**HEICO LIGHTING**  
**Sample No. CRT1306241043-002AA**  
**Model No. H1977.010**  
**Spectral Data Over Visible Wavelengths**





RESULTS OF TESTS (cont'd)

Electrical Measurements at 25°C – Integrating Sphere Method - Full Kit

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)
H1977.010						
CRT1306241043-002AA	UP	120.0	357.5	42.01	0.979	9.35

Intertek Sample No.	Driver Output Voltage (Vrms)	Driver Output Current (Amps)	Driver Output Power (Watts)
CRT1306241043-002AA	9.85	4.11	37.94

Photometric and Electrical Measurements at 25°C – Integrating Sphere Method - Individual Module

Intertek Sample No.	Output Power (Watts)*	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
CRT1306241043-002AA	1.41	112.5	79.79

\*TEST NOTE: Output Power per Module was calculated by dividing total Output Power by number of modules in full kit.

Intertek Sample No.	Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
CRT1306241043-002AA	3508	82.7	14.3	0.001	0.404	0.389	0.236	0.511

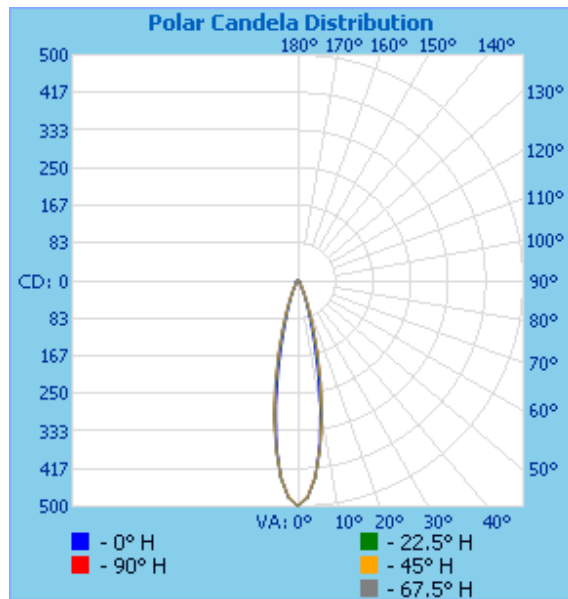
RESULTS OF TESTS (cont'd)

Photometric and Electrical Measurements – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor
H1977.010					
CRT1306241043-002AA	UP	120.1	330.8	38.84	0.978

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
H1977.010					
0	498	498	498	498	498
5	437	438	436	437	437
10	284	301	305	306	301
15	138	155	167	168	162
20	61	69	78	78	75
25	28	32	36	36	35
30	14	16	18	17	17
35	8	8	9	9	9
40	6	5	5	5	5
45	5	4	4	4	4
50	6	4	4	4	4
55	4	3	3	3	3
60	4	3	3	3	3
65	3	2	2	2	2
70	2	2	2	2	2
75	2	2	2	1	1
80	1	1	1	1	1
85	0	1	1	1	1
90	0	0	0	0	0

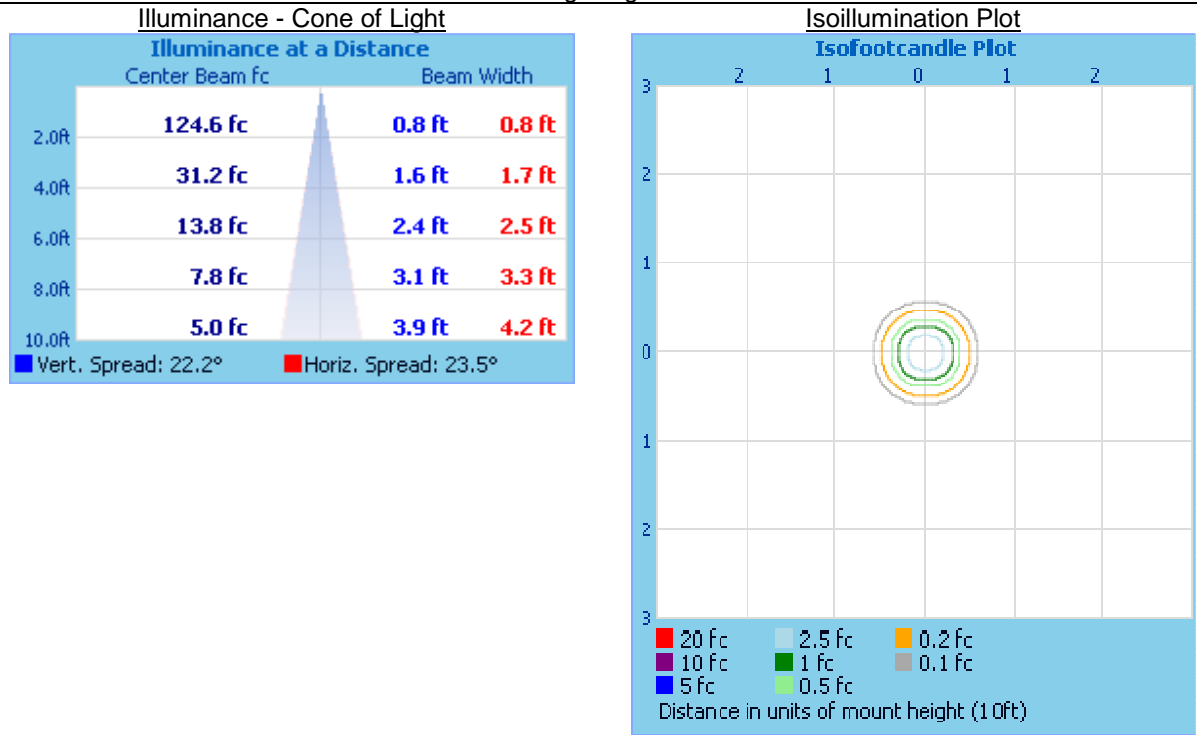




RESULTS OF TESTS (cont'd)

Illumination Plots

Model No.: H1977.010  
 Mounting Height: 10 ft.



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
H1977.010		
0-30	98.5	85.3
0-40	104.2	90.3
0-60	110.7	95.9
60-90	4.6	4.0
0-90	115.3	99.9
90-180	0.1	0.1
0-180	115.4	100.0

Picture (not to scale)



CONCLUSION

The results tabulated in this report are representative of the actual test samples submitted for this report only. The data is provided to the client for further evaluation. Compliance to the referenced specification requirements was not determined in this report.

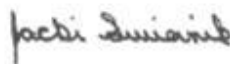
In Charge Of Tests:



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Attachment: None

Report Reviewed By:



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Lighting Division